

II. AMENDMENT

A. Claims

Please replace all of the claims in the application with the following complete set of claims.

1. (Currently amended) A braking system comprising:

~~an a gas~~ accumulator providing a supply of hydraulic braking fluid to the braking system for use in applying a brake, the gas accumulator having ~~an accumulator~~ a gas initially pressurized to a pre-charge pressure;

a pressure detection device which measures the pressure of the hydraulic braking fluid in the gas accumulator and responsively produces an output signal;

a monitoring device which receives the output signal; and

wherein the monitoring device uses the output signal to determine the ~~accumulator pre-charge pressure~~ of the gas in the gas accumulator, compares the ~~accumulator pre-charge pressure~~ to a pressure limit, and uses the results of the comparison in generating a fault signal.

2-9. (Cancelled)

10. (Currently amended) A method of monitoring hydraulic braking fluid pressure in a braking system of a vehicle, the braking system including an accumulator, the method comprising:

measuring the pressure of the hydraulic braking fluid and responsively producing an output signal;

processing the output signal to estimate an accumulator pre-charge pressure;

and

comparing the estimate of the accumulator pre-charge pressure with an ideal value.

11-14. (Cancelled)

15. (Currently amended) The braking system of claim 1 wherein the monitoring device records the pressure of the hydraulic braking fluid in the gas accumulator within a fixed amount of time after a braking system start-up is detected to determine the ~~accumulator~~ pre-charge pressure.

16. (Previously presented) The braking system of claim 15 wherein the monitoring device is further capable of determining a cut-in pressure of the braking system and comparing the cut-in pressure to a cut-in pressure limit, the monitoring device using this comparison in generating a fault signal.

17. (Currently amended) The method of claim 10 wherein comparing the estimate of the accumulator pre-charge pressure with an ideal value further comprises:
calculating a difference between the estimate of the accumulator pre-charge pressure and the ideal value to produce an error value.

18. (Previously presented) The method of claim 17 further comprising:
comparing the error value to a preset limit value and using that comparison to determine whether a fault signal should be generated.

19. (Currently amended) The method of claim 10 wherein processing the output signal to estimate an accumulator pre-charge pressure further comprises comparing several hydraulic braking fluid pressures and determining which one is the best estimate of the accumulator pre-charge pressure.

20. (Currently amended) The method of claim 19 wherein processing the output signal to estimate an accumulator pre-charge pressure further comprises sampling each of the several hydraulic braking fluid pressures at predetermined times after a braking system start-up is detected.

21. (Currently amended) A hydraulic system comprising:
an accumulator providing a supply of pressurized hydraulic fluid to the hydraulic system, the accumulator comprising at least a first chamber for hydraulic fluid which has a first minimum volume when the hydraulic fluid is less than a first pressure, and which expands to a volume greater than the first minimum volume ~~when~~ only after the hydraulic fluid is greater than the first pressure;
a pump which when actuated provides pressurized hydraulic fluid to the first chamber of the accumulator;
a pressure detection device which measures the pressure of the hydraulic fluid in the first chamber of the accumulator and responsively produces an output signal;
a monitoring device which receives the output signal of the pressure detection device, wherein the monitoring device identifies an estimate of the first pressure ~~of the hydraulic fluid~~, and uses the estimate of the first pressure in determining whether to produce a fault signal.

22. (Previously presented) The hydraulic system of claim 21 wherein the monitoring device identifies the estimate of the first pressure by recording the pressure of the hydraulic fluid in the first chamber of the accumulator at a time immediately after the first chamber expands beyond the first volume.

23. (Previously presented) The hydraulic system of claim 21 wherein the monitoring device identifies the estimate of the first pressure by recording several pressures of the hydraulic fluid in the first chamber of the accumulator within a predetermined time after a system start-up is detected.

24. (Previously presented) The braking system of claim 23 wherein the monitoring device selects one of the several pressures to be the first hydraulic fluid pressure.

25-27. (Cancelled)

28. (New) The braking system of claim 24 wherein the predetermined time is 3 seconds.

29. (New) The braking system of claim 24 wherein the predetermined time is 2 seconds.

30. (New) A vehicle comprising:

a set of wheels;

an engine which provides power to drive one or more of the wheels;

a brake associated with one wheel of the set of wheels;

an accumulator providing a supply of pressurized hydraulic braking fluid for use in applying the brake, the accumulator comprising at least a first chamber for hydraulic braking fluid which has a first minimum volume when the hydraulic braking fluid is less than a first pressure, and which expands to a volume greater than the first minimum volume only after the hydraulic braking fluid is greater than the first pressure, the accumulator further comprising a second volume containing a pressurized gas, the pressurized gas being pressurized to a pre-charge gas pressure when there is no hydraulic braking fluid in the first chamber; the second volume also having a cooperative relation with the first volume whereby the second volume contracts when the first volume expands, and the second volume expands when the first volume contracts;

a pump which when actuated provides pressurized hydraulic braking fluid to the first chamber of the accumulator;

a pressure detection device which measures the pressure of the hydraulic braking fluid in the first chamber of the accumulator and responsively produces an output signal;

a monitoring device which receives the output signal of the pressure detection device, wherein the monitoring device samples the pressure of the hydraulic braking fluid in the first chamber of the accumulator in response to and within a 3 second time period following a detection of an engine start-up to calculate the first pressure, and compares the first pressure to an ideal value.

31. (New) A vehicle according to claim 30 wherein if the first pressure is less than the ideal value, the monitoring device detects a fault.

32. (New) A vehicle according to claim 30 wherein when the monitoring device samples the pressure of the hydraulic braking fluid in the first chamber of the accumulator in response to and within a 3 second time period following a detection of an engine start-up, the monitoring device records a plurality of pressure measurements, then determines which one is the best representative of the first pressure.

33. (New) A vehicle according to claim 32 further comprising a pressure sensitive valve in communication with the pump and the accumulator having a cut-in pressure and a cut-out pressure, the valve opening to permit pressurized hydraulic braking fluid to flow from the pump to the accumulator when the pressure of the hydraulic braking fluid in the first chamber of the accumulator falls below the cut-in pressure, and the valve closing to prevent pressurized hydraulic braking fluid from flowing from the pump to the accumulator when the pressure of the hydraulic braking fluid in the first chamber of the accumulator rises above the cut-out pressure.

34. (New) The braking system of claim 33 wherein the monitoring device identifies the cut-in pressure and the cut-out pressure of the valve by monitoring the pressure of the hydraulic braking fluid in the first chamber of the accumulator.